BIOCHEMISTRY

SELENIUM AND VANADIUM: STIMULATOR OF TOXICITY OR INSULIN-MIMETIC?

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Insulin is a very important hormone that is able to regulate a wide variety of cellular and nuclear events. Insulin is able to control these events through the initial binding to a receptor found on the outside of the cell. After binding, the receptor is autophosphorylated, which then stimulates the sequential phosphorylation of various signal proteins. However, errors may occur at any point along this cascade. For this reason, we must explore alternatives to insulin that do not work through a receptor-mediated cascade. The alternatives that are focused on in this study are metals that act as insulin-mimetics. Although these metals have the potential to someday be used as a form of therapy for diabetes, we must further examine their toxic consequences on the cell. In this study, we demonstrated that the insulin mimetic metals, Selenium and Vanadium, do not increase the activation of two known stress related transcription factors, NFk B and AP-1 in a manner similar to Cadmium, a known toxic metal. However, both Selenium and Vanadium appear similar to Cadmium in displaying visible signs of cell death or apoptosis such as cell shrinkage. A.F. was a participant in the NSF REU program at WMU (DBI-0139204).